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EXAMINER	
PEREZ, JULIO R	

ART UNIT	PAPER NUMBER
2617	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/019,705	KALLIOJARVI, KARI	
	Examiner	**Art Unit**	
	JULIO PEREZ	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _01/21/2010_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1,6,9-11,13-15,19 and 22-31_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1,6,9-11, 13-15, 19, 22-31_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments see pages 2-4, filed 01/21/2010, with respect to the rejection(s) of claim(s) 1, 15, 23, 24 under Final Rejection have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of US patent US **6,741,863** to Chiang et al. Applicant presents the arguments that "signal strengths are not time measurements" are not relevant to "at least one feature comprising at least travel time or travel time difference of the signal between the mobile station and at least two base stations." The arguments have been considered and are persuasive. However, the examiner presents a new art to Chiang, which teaches utilization of TOA or time difference techniques for calculating the distance between a caller, i.e., a mobile station, and base stations. Thus, there exists plenty of art that teaches calculation of the distance between the mobile and base stations in order to determine the position of the mobile station.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 6, 10, 11, 13-15, 19, 22-31, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al. (6,741,863) in view of MacDonald (5,732,354).

Regarding claim 1, Chiang discloses a method (and arrangement and a location server) comprising:

measuring at least one feature of a signal transmitted between a mobile station and at least two base stations, the feature being such that it can be used for determination of the distances between the mobile station and the base stations (col. 3, lines 66-67-col. 4, lines 1-63, the distance between two base stations, i.e., r1 and r2, are measured in order to calculate the position of the mobile more accurately with the use of time difference);

computing the distances between the mobile station and the at least two base stations using the measured signal feature (col. 4, lines 1-63, provide data to determine the distances between base stations and the mobile station);

determining a current geographical location of the mobile station based on the determined distances between the mobile station and the at least two base stations; wherein the at least one feature comprises at least travel time or travel time difference of the signal between the mobile station and the at least two base stations (Figures 5A-5B; col. 3, lines 62-col. 4, lines 1-63, provide the distance between two base stations and the mobile station, enough information to locate the mobile station).

Although Chiang discloses a system locating the mobile stain based on determination of distances between the mobile station and base stations with the use of schemes such as TOA or, Chiang does not specifically disclose is determining a

characteristic parameter describing the line-of-sight conditions of the radio propagation environment of at least two base stations, wherein the characteristic parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels. MacDonald, however, discloses propagation loss model based on Hata model that includes propagation path slope within different propagation environment schemes, which in turn describe the propagation path, line of sight characteristics, of the terrain, thus, determining factors (levels) for different type of terrain and building density (col. 6, lines 48-67; col. 7, lines 1-59). McDonald further calculates a location estimate of the mobile telephone with receiving a list of signal strengths received by the telephone from cell sites, i.e., base stations within a serving coverage area and hence calculating the distances between the mobile and a plurality of cell sites (Figure 8; col. 6, lines 39-67, -col. 7, lines 1-15)

Chiang and MacDonald are analogous art because they are from a similar field of endeavor in location of mobile terminals. Thus, it would have been obvious to a person of ordinary skill in the art at the time of invention, to modify the teachings of Chiang with providing determining a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of at least two base stations, wherein the characteristic parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels taught by MacDonald as it is known to implement measurements systems with coefficient factors (levels) or correction factors and determine distances among base stations and the mobile station to provide a more accurate location of the mobile station.

Regarding claim 6, the combination discloses at least one feature comprises at least signal travel time differences between the mobile station and base station (Chiang, col. 4, lines 24-45, the system uses TOA scheme for finding distances between stations).

Regarding claim 10, the combination discloses defining propagation environments for several stations; and classifying the stations in different radio propagation environment classes; wherein the characteristic parameter is based on the class of the station (MacDonald, col. 7, lines 30-40, provides information of environment signals for defining as rural or urban, for instance).

Regarding claim 11, the combination discloses the characteristic parameter is stored and processed in a location service node implemented in the mobile telecommunications system (MacDonald, col. 7, lines 51-67, provides model studies for studying characteristics of terrain).

Regarding claim 13, the combination discloses the determination of the characteristic parameter comprises steps of: determining the current geographical location of said mobile station in way that is external to the telecommunications system; and inputting the results of the determination to the telecommunications system (Chiang, col. 3, lines 62-col. 4, lines 1-6, describes the location of the mobile with external GPS as well).

Regarding claim 14, the combination discloses comprising use of a satellite based positioning system said determining of the current geographical location of the

mobile station (Chiang, col. 3, lines 38-67, describes location with GPS, satellite based system).

Regarding claims 15, 23, Chiang discloses an apparatus comprising:

a measurement device for measuring a feature of a signal transmitted between the mobile station and an antenna of each of the at least two base stations for determination of distances between the mobile station and the at least two base stations (col. 3, lines 66-67-col. 4, lines 1-63, the distance between two base stations, i.e., r1 and r2, are measured in order to calculate the position of the mobile more accurately with the use of time difference;

a controller for receiving an outcome of the measuring for defining the distances between the mobile station and the at least two base stations based on the outcome of the measuring (col. 4, lines 1-63, provide data to determine the distances between base stations and the mobile station), and for determining a current geographical location of the mobile station based on the determined distances between the mobile station and the two base stations (Figures 5A-5B; col. 3, lines 62-col. 4, lines 1-63, provide the distance between two base stations and the mobile station, enough information to locate the mobile station); wherein the feature of the signal is based on travel time or travel time difference of the signal between the mobile station and the at least two base stations col. 3, lines 62-col. 4, lines 1-63, provide the distance between two base stations and the mobile station, enough information to locate the mobile station, providing time difference of arrival of the signal measured).

Although Chiang discloses a system locating the mobile stain based on determination of distances between the mobile station and base stations with the use of schemes such as TOA or, Chiang does not specifically disclose is storage device for storing a characteristic parameter describing line-of-sight conditions of a radio propagation environment of each antenna for at least two base stations, wherein the characteristic parameter describes excess path lengths caused by obstacles in the radio propagation environment by means of one of a number of discrete levels. MacDonald, however, discloses propagation loss model based on Hata model that includes propagation path slope within different propagation environment schemes, which in turn describe the propagation path, line of sight characteristics, of the terrain, thus, determining factors (levels) for different type of terrain and building density (col. 6, lines 48-67; col. 7, lines 1-59). McDonald further calculates a location estimate of the mobile telephone with receiving a list of signal strengths received by the telephone from cell sites, i.e., base stations within a serving coverage area and hence calculating the distances between the mobile and a plurality of cell sites (Figure 8; col. 6, lines 39-67, -col. 7, lines 1-15)

Chiang and MacDonald are analogous art because they are from a similar field of endeavor in location of mobile terminals. Thus, it would have been obvious to a person of ordinary skill in the art at the time of invention, to modify the teachings of Chiang with providing determining a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of at least two base stations, wherein the characteristic parameter describes excess path lengths caused by obstacles in the

environment by means of one of a number of discrete levels taught by MacDonald as it is known to implement measurements systems with coefficient factors (levels) or correction factors and determine distances among base stations and the mobile station to provide a more accurate location of the mobile station.

Regarding claim 19, the combination discloses defining propagation environments for several stations; and classifying the stations in different radio propagation environment classes; wherein the characteristic parameter is based on the class of the station (MacDonald, col. 7, lines 30-40, provides information of environment signals for defining as rural or urban, for instance).

Regarding claim 22, the combination discloses the mobile station comprising a sector antenna (Chiang, Figures 5A-5B; col. 3, lines 62-col. 4, lines 1-63, provide the distance between two base stations and the mobile station, wherein the mobile station transmit via antenna).

Regarding claim 24, Chiang discloses an arrangement comprising: a first station (Figure 5A, # 16 or 2); a second station for communicating by radio with the first station (Figure 5A, #'s 2, 4, 16);

the arrangement configured to define the current geographical location of the first station with a source of location information that is external to the telecommunications system (col. 3, lines 66-67-col. 4, lines 1-63, the distance between two base stations, i.e., r1 and r2, are measured in order to calculate the position of the mobile more accurately with the use of time difference; a GPS system provides location information to mobile and base stations as evidenced by the fact that GPS units, (and within base

station transceivers), in a mobile system, are located within mobile stations for providing and facilitating their geographical positions as well as transmitting such positions to respective base stations), to determine a feature of a radio signal received by one of the stations from two other stations ((col. 3, lines 66-67-col. 4, lines 1-63, the distance between two base stations, i.e., r1 and r2, are measured in order to calculate the position of the mobile more accurately with the use of time difference); wherein the feature of the radio signal is based on travel time or travel time difference of the signal between the station and the other stations (col. 3, lines 66-67-col. 4, lines 1-63, the distance between two base stations, i.e., r1 and r2, are measured in order to calculate the position of the mobile more accurately with the use of time difference).

Although Chiang discloses a system locating the mobile stain based on determination of distances between the mobile station and base stations with the use of schemes such as TOA or, Chiang does not specifically disclose is determining a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of at least two base stations, wherein the characteristic parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels. MacDonald, however, discloses propagation loss model based on Hata model that includes propagation path slope within different propagation environment schemes, which in turn describe the propagation path, line of sight characteristics, of the terrain, thus, determining factors (levels) for different type of terrain and building density (col. 6, lines 48-67; col. 7, lines 1-59). McDonald further calculates a location estimate of the mobile telephone with receiving a list of signal

strengths received by the telephone from cell sites, i.e., base stations within a serving coverage area and hence calculating the distances between the mobile and a plurality of cell sites (Figure 8; col. 6, lines 39-67, -col. 7, lines 1-15)

Chiang and MacDonald are analogous art because they are from a similar field of endeavor in location of mobile terminals. Thus, it would have been obvious to a person of ordinary skill in the art at the time of invention, to modify the teachings of Chiang with providing determining a characteristic parameter describing the line-of-sight conditions of the radio propagation environment of at least two base stations, wherein the characteristic parameter describes excess path lengths caused by obstacles in the environment by means of one of a number of discrete levels taught by MacDonald as it is known to implement measurements systems with coefficient factors (levels) or correction factors and determine distances among base stations and the mobile station to provide a more accurate location of the mobile station.

Regarding claim 25, the combination discloses comprising means for receiving signals from a satellite based positioning system (Chiang, col. 3, lines 38-67, describes location with GPS, satellite based system).

Regarding claim 26, the combination discloses comprising means for determining if an update of the data concerning the radio propagation environment is required (MacDonald, col. 7, lines 5-40, updating data collection during monitoring occurs).

Regarding claim 27, the combination discloses wherein the first station comprises a portable device (Chiang, Figure 5A, terminal 2 may be portable).

Regarding claims 28, 30,, the combination discloses the signal is transmitted from the at least two base stations to the mobile station and the signal is measured at the mobile station (Chiang, col. 3, lines 62-col. 4, lines 1-63, measurements of are provided by the mobile station).

Regarding claims 29, 31, the combination discloses the signal is transmitted from the at least two base stations to the mobile station and the signal is measured at the at least two base stations (Chiang, col. 3, lines 62-col. 4, lines 1-63, measurements of are provided by the mobile station or base stations may measure the signals from the mobile).

4. Claim 9, is rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang in view of MacDonald further in view of Hilsenrath et al., 6,026,304.

Regarding claim 9, Chiang in view of MacDonald does not explicitly disclose, comprising use of a weighted least square method for the determination of distances between the receiving and transmitting stations, wherein the used weighting matrix is the inverse of an error covariance matrix.

However, in a similar field of endeavor, Hilsenrath discloses a method and apparatus in a wireless communication system that accurately determines the transmitter's location (col. 6, lines 6-34-col. 7, lines 9-35-col. 8, lines 15-53). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination with the teachings of Hilsenrath for the purpose of having an entity that would efficiently and accurately locate the mobile station in a coverage area.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JULIO PEREZ whose telephone number is (571)272-7846. The examiner can normally be reached on 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, PATRICK EDOUARD can be reached on (571)272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

2/10/2010
/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2617

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Examiner, Art Unit 2617